

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the above-referenced application.

Listing of Claims:

1. (Original) A semiconductor device, comprising:
 - a semiconductor substrate;
 - a metal film disposed on said semiconductor substrate; and
 - a diffusion barrier film covering an upper surface of said metal film, wherein said diffusion barrier film comprises an insulating material containing silicon, carbon, hydrogen and nitrogen as constituent elements, and wherein said insulating material contains Si-H bond, Si-C bond and methylene bond (-CH₂-).
2. (Original) The semiconductor device as set forth in claim 1, wherein an infrared absorption spectrum of said insulating material includes:
 - I_2/I_1 of not lower than 0.067; where I_1 is defined as an absorption area of an infrared absorption band having a peak near 810 cm⁻¹, and I_2 is defined as an absorption area of an infrared absorption band having a peak near 2,120 cm⁻¹.

3. (Original) The semiconductor device as set forth in claim 1, wherein an infrared absorption spectrum of said insulating material includes:

I_3/I_1 of not higher than 0.0067; where I_1 is defined as an absorption area of an infrared absorption band having a peak near 810 cm^{-1} , and I_3 is defined as an absorption area of an infrared absorption band having a peak near $1,250\text{ cm}^{-1}$.

4. (Original) The semiconductor device as set forth in claim 2, wherein an infrared absorption spectrum of said insulating material includes:

I_3/I_1 of not higher than 0.0067; where I_1 is defined as an absorption area of an infrared absorption band having a peak near 810 cm^{-1} , and I_3 is defined as an absorption area of an infrared absorption band having a peak near $1,250\text{ cm}^{-1}$.

5. (Original) The semiconductor device as set forth in claim 1, wherein said metal film contains copper as a main constituent.

6. (Original) The semiconductor device as set forth in claim 2, wherein said metal film contains copper as a main constituent.

7. (Original) The semiconductor device as set forth in claim 3, wherein said metal film contains copper as a main constituent.

8. (Original) The semiconductor device as set forth in claim 4, wherein said metal film contains copper as a main constituent.

Claims 9 - 11 (Cancelled)

12. (New) A semiconductor device, comprising:

a semiconductor substrate;

a metal film disposed on said semiconductor substrate; and

a diffusion barrier film covering an upper surface of said metal film, wherein said diffusion barrier film comprises an insulating material containing silicon, carbon, hydrogen and nitrogen as constituent elements, and wherein said insulating material contains Si-H bond, Si-C bond and methylene bond ($-\text{CH}_2-$), wherein said diffusion barrier film includes a controlled quantity of said Si-H bond such that a dielectric constant of said diffusion barrier film is less than 5.0.

13. (New) The semiconductor device as set forth in claim 12, wherein an infrared absorption spectrum of said insulating material includes:

I_2/I_1 of not lower than 0.067; where I_1 is defined as an absorption area of an infrared absorption band having a peak near 810 cm^{-1} , and I_2 is defined as an absorption area of an infrared absorption band having a peak near $2,120\text{ cm}^{-1}$.

14. (New) The semiconductor device as set forth in claim 12, wherein an infrared absorption spectrum of said insulating material includes:

I_3/I_1 of not higher than 0.0067; where I_1 is defined as an absorption area of an infrared absorption band having a peak near 810 cm^{-1} , and I_3 is defined as an absorption area of an infrared absorption band having a peak near $1,250\text{ cm}^{-1}$.

15. (New) The semiconductor device as set forth in claim 13, wherein an infrared absorption spectrum of said insulating material includes:

I_3/I_1 of not higher than 0.0067; where I_1 is defined as an absorption area of an infrared absorption band having a peak near 810 cm^{-1} , and I_3 is defined as an absorption area of an infrared absorption band having a peak near $1,250\text{ cm}^{-1}$.

16. (New) The semiconductor device as set forth in claim 12, wherein said metal film contains copper as a main constituent.

17. (New) The semiconductor device as set forth in claim 13, wherein said metal film contains copper as a main constituent.

18. (New) The semiconductor device as set forth in claim 14, wherein said metal film contains copper as a main constituent.

19. (New) The semiconductor device as set forth in claim 15, wherein said metal film contains copper as a main constituent.